

Appl. No. 10/709,922
Amdt. dated June 26, 2006
Reply to Office action of April 03, 2006

Amendments to the Drawings:

Replacement sheets for Figures 1, 2, and 3 are included.

Attachment: Replacement Sheet

3 pages

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REMARKS

The drawings are objected to because of insufficient margins. Also, in Figs. 2 and 3
TEST_MOD should be changed to TEST_MODE

Replacement sheets are provided for all the Figures (Fig1, Fig.2, and Fig.3). As
5 suggested by Examiner, TEST_MOD is also changed to TEST_MODE in Figures 2 and 3.
No other changes are made to the figures and no new matter is added.

The disclosure is objected to because of the following informalities: a) page numbers
missing throughout the disclosure (i.e. Abstract, Specification, Claims, and Drawings).
Page numbers should be added. b) There should be an extra double space at the
10 beginning of each paragraph.

The above problems are a result of the electronic filing process of the above-identified
patent application. Said process utilizes software provided by the US PTO of which applicant
has no control. To solve these problems, applicant has included a clean unmarked substitute
specification above. The clean unmarked substitute specification incorporates all the
15 amendments made in the "Amendments to the Specification" section as described below,
includes page numbers (i.e., page numbers are included on the pages of this response to office
action), includes paragraph indentation at the beginning of each paragraph, and contains no
other amendments. The clean unmarked substitute specification contains no new matter.

20 C) Paragraph 17, CLK" should be changed to CLK'. D) Paragraph 20, in reference to
Fig. 3, the first delay chain 314 is not installed in front of multiplexer 316 as the
specification states. It is installed in front of multiplexer 318. Correction is required. E)
Paragraph 20, in the phrase "groups do not operate synchronous", change synchronous
to synchronously. F) Paragraph 22, the statement, "The embodiments of the present
25 invention disclose the method to input the scanning test signals into each flip-flop group
asynchronously in a predetermined sequence". The Examiner does not know if this are
test data signals or test clock signals. Clarification and correction is required in

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response to this office action. Appropriate correction is required.

Paragraph 17 is amended to replace CLK" with CLK' as suggested by the Examiner.
Paragraph 20 is amended to replace the reference numeral "316" with "318" and to change
"synchronous" with "synchronously" as suggested by the Examiner. Paragraph 22 is
5 amended to clarify "to input the scanning test clock signals into the each flip-flop group
asynchronously". No new matter is entered by the above amendments. In particular, refer to
paragraph 22 stating that "In this way, during the scanning test, different flip-flop groups
operate according to the asynchronous clock signals" (emphasis added).

10 **The claims are objected to because of improper indentation. Where a claim sets forth a
plurality of elements or steps, each element or step of the claim should be separated by a
line indentation, 37 CFR 1.75i. Also, see MPEP 608.01i-p.**

Again, these problems are due to the electronic filing process for the patent application.
Said process utilizes software provided by the USPTO of which applicant has no control. To
15 solve these problems, applicant has ensured that the indentation is proper in the above
"Amendments to the Claims" section.

**Claim 14 is objected to because of the following informalities: "when logic operation"
should recite "when a logic operation". Appropriate correction is required. Claim 17 is
20 objected to under 37 CFR 1.75c.**

Claims 1-17 are cancelled.

**Claim 1-11 are rejected under 35 USC 112, first paragraph, as failing to comply with
the enablement requirement.**

25 Claims 1-17 are cancelled.

**Claims 1-17 are rejected under 35 USC 112, second paragraph, as being indefinite for
failing to particularly point out and distinctly claim the subject matter which applicant**

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regards as the invention.

Claims 1-17 are cancelled.

Claims 1-3, 5-7, 11-17 are rejected under 35 USC 103a as being unpatentable over
5 **Applicant's Admitted Prior Art, hereinafter AAPA, in view of Lurkins (US006964002),**
hereinafter Lurkins.

Claims 1-17 are cancelled.

New Claims 18-21

10 New claims 18-21 are added. Concerning the patentability of new claims 18-21 with respect to the teaching of the cited reference by Lurkins, applicant points out the following two remarks:

Firstly, applicant asserts that one of the major differences between the claimed invention and the AAPA in view of Lurkins is the way to control the MUXes. Fig. 3 of the present
15 application shows all of the multiplexers 316, 318, 358, and 360 are controlled by the same signal TEST_MODE. When the signal TEST_MODE indicates logic high "1", these multiplexers output test clock signals TEST_CLK1, TEST_CLK2, TEST_CLK3 and TEST_CLK4, respectively.

The AAPA fails to teach the first delay element and the second delay element as claimed
20 by claim 18. Lurkins discloses a MUX 20 comprising a delaying unit 94 (Lurkins: Fig. 3). One MUX 20 could be selected to place an undelayed clock signal such as clock signal 70 on connection 30 and the other MUX 20 could be selected to place a delayed clock signal such as clock signal 80 on connection 40 (Lurkins: Figs. 1-3; Col. 4, lines 1-4; Col. 5, lines 59-63). A selection line 100 allows an user to set the MUXes 20 for respectively outputting the
25 undelayed clock signal 70 and the delayed clock signal 80 (Lurkins: Col. 5, lines 55-58). Since these two MUXes 20 are the same, they must operate according to different control signals transmitted by the selection line 100 such that one MUX 20 outputs the undelayed clock signal 70 while the other MUX 20 outputs the delayed clock signal 80. Following this

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5 rational, combining the teachings of Lurkins with the applicant's admitted prior art (AAPA) will also require different control signals for the multiplexers. Therefore, applicant asserts that the AAPA in view of Lurkins fails to disclose different multiplexers for outputting different delayed test clock signals according to the same control signal as is claimed in claim 18 of the present invention.

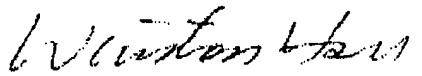
Secondly, applicant asserts that another major difference between the claimed invention and the AAPA in view of Lurkins is the control signals of the flip-flops. Alternating flip-flops 52-58 of Lurkins (Fig.1 of Lurkins) are controlled by different control signals 70 on connection 30 and 80 on connection 40. That is, the control signal of the flip flops 52-58 is alternated for all flip flops 52-58 in the scan chain in order to reduce the chances of a race condition occurring between the different flip-flops during scan testing. See Lurkins (col 5, lines 7-10) stating, "If the clock signals are 180 degrees out of phase as shown in Fig.2 and if alternating flip-flops receive clock pulses from alternating clock signals, a race condition cannot occur in a scan chain." However, in the present invention as claimed in claim 18, a first flip-flop group 322 of the first clock domain 310 including a plurality of flip-flops for doing a scanning test is controlled by the output signal of the first multiplexer 318. These flip-flops are all within the first clock domain 310 and are all controlled by the output of the first multiplexer 318. Likewise, a second flip-flop group 362 of the second clock domain 350 including a plurality of flip-flops for doing a scanning test is controlled by the output signal of the second multiplexer 358. Applicant asserts that it would not be obvious to modify the AAPA to add Lurkins' delaying unit 94 in order to delay the AAPA's TEST_CLK connection to the multiplexers and result in the present invention (as was stated by the Examiner concerning the rejection of claim 1 in the office action mailed 04/03/2006) because each flip flop in each of the respective clock domain groups would be controlled by the same clock signal within that clock domain group and therefore race conditions could still occur within each clock domain group. Such a result would directly contrast with the teachings of Lurkins. For at least this reason, applicant asserts that Lurkins teaches against combining with the AAPA to result in the present invention as claimed in claim 18. Therefore, applicant

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asserts that new claim 18 should be found allowable with respect to the teachings of Lurkins. Because claims 19-21 are dependent on claim 18, if claim 18 is found allowable, so too should dependent claims 19-21. Consideration of new claims 18-21 is respectfully requested.

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Sincerely yours,



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15 Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 12 hours behind the Taiwan time, i.e. 9 AM in D.C. = 9 PM in Taiwan.)